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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,849	08/31/2000	Sarath Kumar	16-11-30-5	4424
7590	01/24/2005		EXAMINER	
Harness Dickey & Pierce PLC P O Box 8910 Reston, VA 20195				D AGOSTA, STEPHEN M
			ART UNIT	PAPER NUMBER
			2683	

DATE MAILED: 01/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/651,849	KUMAR ET AL.
	Examiner	Art Unit
	Stephen M. D'Agosta	2683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 12 November 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1,3-6,9-11,15-17,21,23,24,27,28 and 30-33 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1,4,6,9,11,17,24,28 and 31-33 is/are rejected.  
 7) Claim(s) 3, 5, 10, 15, 16, 21, 23, 27 and 30 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
     Paper No(s)/Mail Date \_\_\_\_\_.

4) Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

In view of the Appeal filed on 11-12-04, PROSECUTION IS HEREBY REOPENED. The rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 4, 6, 9, 11, 17, 24, 28 and 31-33** rejected under 35 U.S.C. 103(a) as being unpatentable over Sindhushayana US 2004/0181744 and further in view of Yellin US 6,603,823.

As per **claims 1, 11, 17 and 24**, Sindhushayana teaches a wireless receiver (figure 2 shows a receiver/demodulator, #44) comprising:

a receiver for receiving a wireless signal comprising pilot symbols and data symbols (figure 2 shows receiver with pilot, control and data outputs from #66 and #64); and

a demodulator for generating a log-likelihood (abstract and figure 5, #96) ratio as a function of a scale factor (figure 5: a total received signal energy computation circuit 126, and a pilot energy calculation circuit 138, which reads on scale factor as defined by the applicant:

“In a wireless receiver, demodulation of a received signal involves the generation of a log-likelihood ratio (LLR) for each received bit. This is performed in accordance with a scale factor, which is determined as a function of a ratio of energy components of the transmitted signal. In an embodiment of the invention, a UMTS receiver uses PSAM in demodulating a received BPSK signal. The UMTS receiver uses a single column look-up table (excluding index) to provide a scale factor for use in demodulation of the received signal. In particular, a ratio of the transmitted energy per pilot symbol to the transmitted energy; per data symbol provides an index into the look-up table to return a value for the scale factor, which provides better performance during periods when the fading distribution is unknown.”.

wherein the scale factor is stored in a look-up table such that an index into the look-up table used in retrieving the scale factor is a function of a of the received pilot symbols of the wireless signal (figure 5, #140) **but is silent on** noise variance.

Yellin teaches a receiver (abstract teaches received data) that uses a lookup table and maximum-likelihood ratio (C7, L17) when calculating noise variance (abstract and figure 2, #32) of pilot, data, power, etc. signals (C1, L58 to C2, L8).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Sindhushayana, such that such that an index into the look-up table used in retrieving the scale factor is a function of a noise variance of the received pilot symbols of the wireless signal, to provide an algorithm that takes into account noise variance calculations based on data and pilot signals.

As per **claims 4, 28, 31, 32, 33**, Sindhushayana teaches claim 1 further comprising a processor for determining the scale factor as a function of the noise variance of the received pilot symbols of the received wireless signal (figure 2 shows receiver with pilot, control and data outputs from #66 and #64).

As per **claim 6**, Sindhushayana teaches claim 1 comprising a memory for storing the look-up table (figure 5 #140 is a lookup table and inherently comprises memory).

As per **claim 9**, Sindhushayana teaches claim wherein the receiver comprises a demultiplexer for providing a data signal, representing the data symbols, and a control signal, representing the pilot symbol (figure 2 shows demodulated/demultiplexed pilot, control and data signals outputted from #64 and #66).

### ***Allowable Subject Matter***

**Claims 3, 5, 10, 15-16, 21, 23, 27, and 30** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen D'Agosta  
1-12-2005



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